3.2 Water Quality Standards

Water Quality Standards (WQS) for lakes, streams, rivers, wetlands and other surface waters are established by States and certain Indian Tribes under the federal Clean Water Act (CWA). Water Quality Standards define the water quality goals of a water body by designating the use or uses to be made of the water, by setting criteria necessary to protect the uses and by preventing degradation of water quality through antidegradation provisions. They play an important role in protecting the quality of the waters of the United States by establishing the target water quality for waste water discharges, watershed management plans and TMDLs. Three states and one Indian tribe have WQS standards promulgated pursuant to section 303(c) of the CWA that apply to the Columbia and Snake Rivers: Idaho, Oregon, Washington and the Confederated Tribes of the Colville Reservation. Another Indian tribe, the Spokane Tribe of Indians has WQS for the Columbia River that have been adopted by the tribe but not yet approved by EPA. The WQS for each state and tribe for the portions of the Columbia and Snake Rivers subject to this TMDL are summarized below:

Idaho

The WQS for Idaho are established in the Idaho Administrative Code, IDAPA 16.01.02, "Water Quality Standards and Wastewater Treatment Requirements." Section 130.02 establishes the designated aquatic life uses of the Snake River between the Salmon River and the Washington Border as cold water. Section 100.01.a defines cold water as "water quality appropriate for the protection and maintenance of a viable aquatic life community for cold water species." Section 250.02.b establishes the water quality criteria for temperature for the cold water aquatic life use designation as "Water temperature of twenty-two (22) degrees C or less with a maximum daily average of no greater than nineteen (19) degrees C."

Section 070.06 discusses natural background conditions: "Where natural background conditions from natural surface or groundwater sources exceed any applicable water quality criteria as determined by the Department, that background level shall become the applicable site-specific water quality criteria. Natural background means any physical, chemical, biological, or radiological condition existing in a water body due only to non-human sources. Natural background shall be established according to protocols established or approved by the Department consistent with 40 CFR 131.11. The Department may require additional or continuing monitoring of natural conditions."

Oregon

The WQS for Oregon are established in the Oregon Administrative Rules, OAR 340-040-0001 to OAR 340-040-0210, "State-Wide Water Quality Management Plan; Beneficial Uses, Policies, Standards, and Treatment Criteria for Oregon."

The Snake River in Oregon from the OR/WA Border at river mile 176 to the Salmon River at river mile 188 is included in this TMDL. The beneficial uses most sensitive to temperature in that reach are "Anadromous Fish Passage", "Salmonid Fish Rearing" and "Salmonid Fish Spawning". The temperature criteria applicable to this reach are:"

> Unless specifically allowed under a Department-approved surface water temperature management plan as required under OAR 340-41-026(3)(a)(D), no measurable surface water temperature increase resulting from anthropogenic activities is allowed:
> (i) in a basin for which salmonid rearing is a designated beneficial use, and in which surface water temperatures exceed 64.0 deg F (17.8 deg C);

(ii) In waters and periods of the year determined by the Department to support native salmonid spawning, egg incubation, and fry emergence from the egg and from the gravels in a basin which exceeds 55 deg F (12.8 deg C)."

The period of the year designated by the Oregon Department of Environmental Quality for the protection of salmonid spawning, egg incubation, and fry emergence in this area is October 1 through June 30.

The numeric temperature criteria are measured as the seven-day moving average of the daily maximum temperatures. If there is insufficient data to establish a seven-day average of maximum temperatures, the numeric criterion is applied as an instantaneous maximum. A measurable surface water increase is defined as 0.25 deg F. Anthropogenic is defined to mean that which results from human activity.

The segment of the Columbia River which serves as the OR/WA border is included in this TMDL and subject to OR WQS. It stretches from the mouth of the river at river mile 0 to river mile 309. The temperature sensitive beneficial uses vary from segment to segment along that reach as shown in Table 3-1.

Table 3-1: Oregon designated uses along the Columbia River

Basin/Columbia River Miles	Anadromous Fish Passage	Salmonid Fish Rearing	Salmonid Fish Spawning	Shad and Sturgeon Spawning/Rearing
Lower Columbia / 0-86	X	X	X	
Willamette / 86-120	X	X	X	
Sandy / 120-147	X	X		
Hood / 147-203	X	X	X	X
Deschutes /203-218	X	X		
John Day / 218-247	X	X	X	
Umatilla / 247309	X	Trout	Trout	

The temperature criterion applicable to the Columbia River in Oregon is:

"Unless specifically allowed under a Department-approved surface water temperature management plan as required under OAR 340-41-026(3)(a)(D), no measurable surface water temperature increase resulting from anthropogenic activities is allowed in the Columbia River or its associated sloughs and channels from the mouth to river mile 309 when surface water temperatures exceed 68.0 deg F (20.0 deg C)."

Washington

The WQS for Washington are established in the Washington Administrative Code, Chapter 173-201A WAC, "Water Quality Standards for Surface Waters of the State of Washington." Waters of the state are categorized in the Water Quality Standards into classes based on the character of the uses of each waterbody. The designated uses of the Columbia and Snakes rivers most sensitive to temperature are salmonid migration, rearing, spawning and harvesting; and other fish migration, rearing, spawning and harvesting. The most protected class on the Columbia Snake is "AA" or 'extraordinary' and this applies only to Lake Roosevelt. The rest of the river is grouped into class "A" or 'excellent'. Under each of these classes, the temperature standard is applicable at any time of day or night. It applies toward fish protection in all portions of the rivers, including fish passage facilities and fish ladders within the dam structures.

Each class of water is assigned a maximum temperature. For class "AA" waters it is16 centigrade. For class "A" waters it is 18 degrees centigrade. However, for the Columbia River below Priest Rapids dam and for the entire Snake River, a special condition applies which is two degrees higher, 20 degrees centigrade.

"Natural Conditions" for temperature means water temperatures as they are best assessed to have existed before any human-caused pollution or alterations. If the Snake or Columbia Rivers are found to have a natural condition higher than the standard, no additional temperature pollution can be added that will result in raising the temperature more than 0.3 degrees centigrade. This would be measured as the cumulative impact of all dischargers as measured by the far-field TMDL model.

Incremental temperature increases are allowed when existing temperatures are below

the standard as long as the standard maximum temperature is not exceeded. This is different for different parts of the river. Some of these increases are expressed as formulas. Generally, they are more restrictive for the upper portions of the rivers. The temperature criteria and incremental temperature increases applicable to the Snake and Columbia Rivers in Washington are summarized in Table 3-2.

Table 3-2: **Washington Water Quality Criteria along the Columbia River**

Water Body	***Criteria***
Columbia Main Stem from the coast to the Oregon/Washington Border	"Temperature shall not exceed 20 deg C (68 F) due to human activities. When natural conditions exceed 20 deg C (68 F) no temperature increases will be allowed which will raise the receiving water temperature by greater than 0.3 deg C (0.5 F) nor shall such temperature increases, at any time exceed 0.3 deg C (0.5 F) due to a single source or 1.1 deg C (2.0 F) due to all such activities combined."
Columbia Main Stem Priest Rapids Dam to OR/WA Border	"Temperature shall not exceed 20 deg C (68 F) due to human activities. When natural conditions exceed 20 deg C (68 F) no temperature increases will be allowed which will raise the receiving water temperature by greater than 0.3 deg C (0.5 F) nor shall such temperature increases, at any time exceed t=34/(T+9)."
Columbia Main Stem Priest Rapids to Grand Coulee	"Temperature shall not exceed 18 deg C (64.4 F) due to human activities. When natural conditions exceed 18 deg C (64.4 F) no temperature increases will be allowed which will raise the receiving water temperature by greater than 0.3 deg C (0.5 F). Incremental temperature increases resulting from point source activities shall not, at any time, exceed t=28/(T+7). Incremental increases resulting from nonpoint source activities shall not exceed 2.8 deg C (5.4 F)."
Columbia Main Stem Above Grand Coulee	"Temperature shall not exceed 16 deg C (60.8 F) due to human activities. When natural conditions exceed 16 deg C (60.8 F) no temperature increases will be allowed which will raise the receiving water temperature by greater than 0.3 deg C (0.5 F). Incremental temperature increases resulting from point source activities shall not, at any time, exceed t=23/(T+5). Incremental increases resulting from nonpoint source activities shall not exceed 2.8 deg C (5.4 F)."
Snake Main Stem from the Washington/Oregon Border to the Clearwater River.	"Temperature shall not exceed 20 deg C (68 F) due to human activities. When natural conditions exceed 20 deg C (68 F) no temperature increases will be allowed which will raise the receiving water temperature by greater than 0.3 deg C (0.5 F) nor shall such temperature increases, at any time exceed 0.3 deg C (0.5 F) due to a single source or 1.1 deg C (2.0 F) due to all such activities combined."
Snake Main Stem from the Clearwater River to the Columbia River.	"Temperature shall not exceed 20 deg C (68 F) due to human activities. When natural conditions exceed 20 deg C (68 F) no temperature increases will be allowed which will raise the receiving water temperature by greater than 0.3 deg C (0.5 F) nor shall such temperature increases, at any time exceed t=34/(T+9)."

t = the maximum permissible temperature increase measured at a mixing zone boundary
T = the background temperature as measured at a point or points unaffected by the discharge and representative of the highest ambient water temperature in the vicinity of the discharge.

Confederated Tribes of the Colville Reservation

The WQS for the Confederated Tribes of the Colville Reservation were promulgated by EPA at 40 CFR 131.135. These standards apply to the Columbia River from the northern boundary of the reservation downstream to Wells Dam. The Columbia River is designated as "Class I (Extraordinary)" from the Northern Border of the Reservation to Chief Joseph Dam and "Class II (Excellent)" from Chief Joseph Dam to Wells Dam. The designated uses most sensitive to temperature are "Fish and shellfish: Salmonid migration, rearing, spawning and harvesting: other fish migration, rearing, spawning and harvesting." The temperature criterion for Class I waters is:

> "(D) Temperature - shall not exceed 16.0 degrees C due to human activities. Temperature increases shall not, at any time, exceed t=23/(T+5).
> (1) When natural conditions exceed 16.0 degrees C, no temperature increase will be allowed which will raise the receiving water by greater than 0.3 degrees C.
> (2) For purposes hereof, "t" represents the permissive temperature change across the dilution zone: and "T" represents the highest existing temperature in this water classification outside of any dilution zone.
> (3) Provided that temperature increase resulting from nonpoint source activities shall not exceed 2.8 degrees C, and the maximum water temperature shall not exceed 16.3 degrees C."

The temperature criterion for Class II waters is:

> "Temperature - shall not exceed 18.0 degrees C due to human activities. Temperature increases shall not, at any time, exceed t=28/(T+7).
> (1) When natural conditions exceed 18.0 degrees C, no temperature increase will be allowed which will raise the receiving water by greater than 0.3 degrees C.
> (2) For purposes hereof, "t" represents the permissive temperature change across the dilution zone: and "T" represents the highest existing temperature in this water classification outside of any dilution zone.
> (3) Provided that temperature increase resulting from nonpoint source activities shall not exceed 2.8 degrees C, and the maximum water temperature shall not exceed 18.3 degrees C."
> Table 3.3 summarizes the criteria that apply to the Columbia and Snake Rivers.

Table 3.3: Summary of Water Quality Criteria for the Columbia and Snake Rivers

River Reach	Idaho	Oregon (7 day running ave of the daily maximums)	Washington (Maximum)	Colville Reservation (Maximum)
Snake: Salmon R to OR Border	19 C daily ave 22 C max	Oct 1 to June 30 - 12.8 C or natural July 1 to Sep 30 17.8 or natural		
Snake: Or Border to Clearwater R.	19 C daily ave 22 C max		20 C or natural + .3 C	
Snake: Clearwater to mouth			20 C or natural + .3 C	
Columbia: Can Border to Grand Coulee			16 C or Natural + .3 C	16 C or Natural + .3 C*
Grand Coulee to Chief Joseph			18 C or Natural + .3 C	16 C or Natural + .3 C
Chief Joseph to Wells			18 C or Natural + .3 C	18 C or Natural + .3 C
Wells to Priest Rapids			18 C or Natural + .3 C	
Priest Rapids to OR Border			20 C or Natural + .3 C	
OR Border to mouth		20 C or natural	20 C or Natural + .3 C	

* Applies from the Northern Boundary of the Colville Reservation (approximately River Mile 721) to Grand Coulee Dam